

Name: _____ Date: _____

Polynomial Operations EXAM (version 234)

1. Let polynomials $p(x)$ and $q(x)$ be defined below.

$$p(x) = 2x^5 + 9x^3 - 5x^2 - x + 4$$

$$q(x) = -2x^5 - 8x^4 + x^3 + 3x + 7$$

Express the difference $p(x) - q(x)$ in standard form.

2. Let polynomials $a(x)$ and $b(x)$ be defined below.

$$a(x) = -3x^2 - 2x - 8$$

$$b(x) = -2x - 7$$

Express the product $a(x) \cdot b(x)$ in standard form.

3. Express $(x + 1)^5$ in standard (expanded) form.

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4. Let polynomials $f(x)$ and $g(x)$ be defined below.

$$\begin{aligned}f(x) &= -5x^3 + 23x^2 + 6x + 18 \\g(x) &= x - 5\end{aligned}$$

The quotient of $\frac{f(x)}{g(x)}$ can be expressed as a polynomial, $h(x)$, and a remainder, R (a real number).

$$\frac{f(x)}{g(x)} = h(x) + \frac{R}{x - 5}$$

By using synthetic division or long division, express $h(x)$ in standard form, and find the remainder R .

5. Let polynomial $f(x)$ still be defined as $f(x) = -5x^3 + 23x^2 + 6x + 18$. Evaluate $f(5)$.